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PROFESSIONAL EXPERIENCE

2001 to present Insmed, Inc. Richmond, VA
Program Integration following merger of Celtrix Pharmaceuticals, Inc. with Insmed, Inc.

- Integration of Celtrix's SomatoKine programs with Insmed's INS programs.
- Development of new company strategies following merger.
- Oversight of all aspects of SomatoKine drug development including research, clinical development and transfer of GMP manufacturing process to overseas contract facility.
- Participation in business development and investor relations representing the acquired SomatoKine program.
- Attendance at Board of Directors meetings providing post-merger updates relevant to the newly acquired SomatoKine program.
- Successful completion of the development and transfer of a cost-effective large-scale recombinant protein GMP manufacturing process for SomatoKine.
- Submission of major orphan drug application to the US FDA for the use of SomatoKine in four new indications.
- Organization of pivotal clinical trial for SomatoKine treatment of growth hormone insensitivity (Laron Syndrome).

1995 to 2000 Celtrix Pharmaceuticals, Inc. San Jose, CA
President and Chief Executive Officer and Member of Board of Directors

- Successful negotiation of merger with Insmed, Inc. (announced 12/01/99).
- Completion of Celtrix/Insmed merger-based \$100 million financing.
- Directing the rapid development of the lead product candidate (SomatoKine) from preclinical stage to successful completion of several Phase II clinical trials in a variety of different indications.
- Leading the development of a GMP manufacturing process in company-owned manufacturing facility and successful production of kg quantities of clinical grade human recombinant protein drug.
- Negotiation of major corporate partnerships (Green Cross Corporation, Genzyme Corporation, Elan Corporation).
- Development of credible relationships with investment community resulting in completion of several rounds of financings.
- Initiated and successfully completed several restructurings of the company, adjusting to diverse financing climates, to control spending and to focus on the development of the most promising clinical programs.
- Building and leading a highly effective executive team.

1993 -1995	Celtrix Pharmaceuticals, Inc.	San Jose, CA
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Senior Vice President

- Reporting to CEO/President. Directing all Vice Presidents of company with full responsibility for Operations involving a team of 203 employees.
- Establishment and administration of operations budget (>\$20 million).
- Oversight of research, clinical development, regulatory affairs and GMP manufacturing of human recombinant protein drugs.
- Participation in corporate partnering and financing activities by delivering scientific and operational presentations.

1991-1995

Celtrix Pharmaceuticals, Inc.

San Jose, CA

Vice President, Research

- Directing all research activities of the company.
- Management of Ph.D. scientists with skills in the areas of molecular biology, cell biology, immunology, protein chemistry, pharmacology, ophthalmology, recombinant protein manufacturing process development, preclinical efficacy and safety testing, drug formulation and stability
- Presentation of research data to prospective investors, corporate partners and to the Board of Directors

1989-1991

BioGrowth, Inc.

Richmond, CA

Vice President, Research and Development

- Presentation of science and technology of the privately held biotechnology company in acquisition discussions with Celtrix Pharmaceuticals, Inc. Acquisition of BioGrowth, Inc. by Celtrix Pharmaceuticals, Inc. was successfully completed in December, 1991.
- Assembled scientific team and directed the fundamental discoveries which ultimately led to the development of the "SomatoKine" technology.
- Presentation of project science and technology to potential investors, corporate partners and the Board of Directors.

1984-1989

Synergen, Inc.

Boulder, CO

Project Leader

- Vascular Biology, Growth Factor Biology, Protein Chemistry.
- Member of Synergen Science Council.
- Member of Synergen Recruitment Committee.

1982-1984

University of California

Davis, CA

Principal Investigator / Faculty Member

- Research: Structure and Function of Ribosomal Proteins.
- Teaching: Biochemistry for Medical Students.

EDUCATION AND TRAINING

1974-1981

UC Davis, Univ. of Basel

USA, Switzerland.

Postdoctoral Fellow, Advanced Research Fellow, Founder of Aviation Business.

- Postgraduate Education and Training in Protein Chemistry and Molecular Genetics
- Establishment of Aviation Business.

1970-1973

University of California

Davis, CA

Ph.D. Microbiology

1965-1969 Swiss Federal Institute of Technology Zurich, Switzerland.
Diploma Engineer, Technical Microbiology

AWARDS

- 1969 Fellowship, Rotary International.
- 1973-1974 Postdoctoral Fellowship, European Molecular Biology Organization (EMBO).
- 1976-1978 Advanced Research Fellowship, Swiss National Science Foundation.
- 1984 US National Institutes of Health (NIH) Grant AM R23 341 40.

PATENTS

1. **6,124,259** Methods for treating ophthalmic disorders. Delmage M.J, **Sommer A.** (September 26, 2000).
2. **6,040,292** Methods for treating diabetes. **Sommer A.** (March 21, 2000).
3. **5,948,757** High dose IGF-1 therapy. **Sommer A.** et al. (September 7, 1999).
4. **5,789,547** Method of producing insulin-like growth factor-I (IGF-I) and insulin-like growth factor binding protein-3 (IGFBP-3) with correct folding and disulfide bonding. **Sommer A.** et al. (August 4, 1998).
5. **5,643,867** Method for treating catabolic conditions. Maack CA, **Sommer A.** et al. (July 1, 1997).
6. **5,407,913** Method and Composition for Systemic Treatment of Tissue Injury **Sommer A.** Maack C.A. (April 18, 1995).
7. **5,332,804** High molecular weight forms of human basic fibroblast growth factor, an angiogenic protein. Florkiewicz, R.Z., and **Sommer, A.** (July 26, 1994).
8. **5,188,943** Method of producing high molecular weight human fibroblast growth factors. Florkiewicz RZ and **A. Sommer** et al. (February 23, 1993).
9. **4,994,559** Human basic fibroblast growth factor. Moscatelli D and **Sommer A.** et al. (February 19, 1991).
10. **5,026,839** DNA encoding a basic fibroblast growth factor. Moscatelli D. and **Sommer A.** et al. (June 25, 1991).
11. **5,075,222** Interleukin-1 inhibitors. Hannum, C.E., Eisenberg, S.P., Thompson, R.C., Arend, W.P., Joslin, F.G., and **Sommer, A.** (December 24, 1991).

PUBLICATIONS

1. Boonen, S., Rosen, C., Bouillon, R., **Sommer, A.**, McKay, M., Vanderschueren, D., Geusens, P. (2002). Musculoskeletal effects of the recombinant human IGF-I/IGF binding protein-3 complex in osteoporotic patients with proximal femoral fracture: a double-blind, placebo-controlled pilot study. *J. Clin. Endocrinol. Metab.* 87(4): 1593-1599.
2. Clemmons, D., Moses, A., McKay, M., **Sommer, A.**, Rosen, D.M., and Ruckle, J. (2000). The Combination of Insulin-like Growth Factor-I and Insulin-like Growth Factor Binding Protein-3 Reduces Insulin Requirements in Insulin-dependent Type 1 Diabetes: Evidence for *In Vivo* Biological Activity. *J. Clin. Endocrinol. Metab.* 85(4): 1518-1524.
3. Rosen, D.M., Adams, S., Maack, C.A., Moore, J.A., and **Sommer, A.** (1997). Modulation of IGF-I Therapy by IGFBP-3: Potential Utility in Wound Healing. In *Growth Factors and Wound Healing: Basic Science and Potential Clinical Applications*. Eds. T.R. Ziegler, G.F. Pierce, and D.N. Herndon. (Serono Symposium). Pp. 281-290.
4. Adams, S., Moore, J., Chu, S., Bagi, C., DeLeon, L., Liu, C., Schmidt, D., **Sommer, A.** (1995). Pharmacokinetics and Bioavailability of rhIGF-I/IGFBP-3 in the Rat and Monkey. *Progress in Growth Factor Research*, 6, 347-356.
5. Bagi, C.M., DeLeon, L., Brommage, R., Rosen, D., and **Sommer, A.** (1995). Treatment of Ovariectomized Rats with the Complex of rhIGF-I/IGFBP-3 Increases Cortical and Cancellous Bone Mass and Improves Structure in the Femoral Neck. *Calcified Tissue International*, 57, 40-46.
6. Bagi, C.M., van der Meulen, M.C.H., Brommage, R., Rosen, D., and **Sommer, A.** (1995). The Effect of Systemically Administered rhIGF-I/IGFBP-3 Complex on Cortical Bone Strength and Structure in Ovariectomized Rats. *Bone*, 16, 559-565.
7. Bagi, C., DeLeon, E., Brommage, R., Adams, S., Rosen, D., and **Sommer, A.** (1995). Systemic Administration of rhIGF-I or rh IGF-I/IGFBP-3 Increases Cortical Bone and Lean Body Mass on Ovariectomized Rats. *Bone*, 16, 263S-269S.
8. Fielder, P.J., Rosenfeld, R.G., Graves, H.C., Grandbois, K., Maack, C.A., Sawamura, S., Ogawa, Y., **Sommer, A.**, Cohen, P. (1994). Biochemical Analysis of Prostate Specific Antigen-Proteolyzed Insulin-Like Growth Factor Binding Protein-3. *Growth Regulations* 4, 164-172.
9. Bagi, C.M., Brommage, R., DeLeon, L., Adams, S., Rosen, D., and **Sommer, A.** (1994). Benefit of Systemically Administered rhIGF-I and rhIGF-I/IGFBP-3 on Cancellous Bone in Ovariectomized Rats. *Journal of Bone and Mineral Research*, 9, 1301-1312.
10. **Sommer, A.**, Spratt, S.K., Tatsuno, G.P., Tressel, T., Lee, R., and Maack, C.A. (1993). Properties of Glycosylated and Nonglycosylated Human Recombinant IGF Binding Protein-3 (IGFBP-3). *Growth Regulation* 3, 46-49.
11. Presta, M., Rusnati, M., Urbinati, C., **Sommer, A.**, Ragnotti, G. (1991). Biologically active synthetic fragments of human basic fibroblast growth factor (bFGF). Identification of two Asp-Gly-Arg-containing domains involved in the mitogenic activity of bFGF in endothelial cells. *J. Cell Physiol.*, 149, 512-524.
12. **Sommer, A.**, Maack, C.A., Spratt, S.K., Mascarenhas, D., Tressel, T.J., Rhodes, E.T., Lee, R., Roumas, M., Tatsuno, G.P., Flynn, J.A., Gerber, N., Taylor, J., Cudny, H.,

- Nanney, L., Spencer, E.M., and Hunt, T.K. (1991). Molecular Genetics and Actions of Recombinant IGFBP-3. In: Modern Concept of Insulin-Like Growth Factors. Elsevier Science Publishers, New York City, New York, 715-728.
13. Spratt, S.K., Tatsuno, G.P., and **Sommer, A.** (1991). Cloning and Characterization of Bovine Insulin-Like Growth Factor Binding Protein-3 (bIGFBP-3). *Biochem. Biophys. Res. Commun.* 177, 1025-1032.
 14. Tressel, T.J., Tatsuno, G.P., Spratt, K., and **Sommer, A.** (1991). Purification and characterization of human recombinant insulin-like growth factor binding protein 3 (hIGFBP-3) expressed in Chinese hamster ovary cells. *Biochem. Biophys. Res. Commun.* 178, 625-633.
 15. Hannum, C.H., Wilcox, C.J., Arend, W.P., Joslin, F.G., Dripps, D.J., Heimdal, P.L., Ames, L.G., **Sommer, A.**, Eisenberg, S.P., and Thompson, R.C.. (1990). Interleukin-1 receptor antagonist activity of a human interleukin-1 inhibitor. *Nature* 343, 336-340.
 16. Lin, L.F., Ames, L.G., **Sommer, A.**, Smith, D.J. and Collins, F. (1990). Isolation and characterization of ciliary neurotrophic factor from rabbit sciatic nerves. *J. Biol. Chem.* 265, 8942-8947.
 17. Kohno, T., Carmichael, D.F., **Sommer, A.**, Thompson, R.C. (1990). Refolding of recombinant proteins. *Methods Enzymol* 185, 187-95.
 18. Florkiewicz, R.Z., and **Sommer, A.** (1989). The human basic fibroblast growth factor gene produces three polypeptides: Two translate from Non-AUG condons. *Proc. Natl. Acad. Sci. USA* 86, 3978-3981.
 19. Quarto, N., Talarico, D., **Sommer, A.**, Florkiewicz, R., Basilico, C., and Rifkin, D. (1989). Transformation by basic fibroblast growth factor requires high levels of expression. Comparison with transformation by hst/k-fgf. *Oncogene Res.* 5, 101-110.
 20. **Sommer, A.**, Moscatelli, D., and Rifkin, D.B. (1989). An amino-terminally extended and posttranslationally modified form of a 25kD basic fibroblast growth factor. *Biochem. Biophys. Res. Commun.* 160, 1267-1274.
 21. **Sommer, A.**, and Rifkin, D.B. (1989). Interaction of heparin with human basic fibroblast growth factor (FGF): Protection of the angiogenic protein from proteolytic degradation by a glycosaminoglycan. *J. Cellular Physiol.* 138, 215-220.
 22. Squires, C.H., Childs, J., Eisenberg, S.P., Polverini, P.J., and **Sommer A.** (1988). Production and characterization of human basic fibroblast growth factor from *E. coli*. *J. Biol. Chem.* 263, 16297-16302.
 23. Kohno, T., Carmichael, D.F., **Sommer, A.** and Thompson, R.C. (1988). Refolding of recombinant proteins. *Methods in Enzymology* 138, 215-220.
 24. McGee, G.S., Davidson, J.M., Buckley, A., **Sommer, A.**, Woodward, S.C., Aquino, A.M., Barbour, R., and Demetriou, A.A. (1988). Recombinant basic fibroblast growth factor accelerates wound healing. *J. Surg. Res.* 45, 145-149.
 25. Saksela, O., Moscatelli, D., **Sommer, A.**, and Rifkin, D.B. (1988). Endothelial cell-derived heparan sulfate binds basic fibroblast growth factor and protects it from proteolytic degradation. *J. Cell Biol.* 107, 743-751.

26. **Sommer, A.**, Brewer, M.T., Thompson, R.C., Moscatelli, D., Presta, M., and Rifkin, D.B. (1987). In *Angiogenesis: Mechanism and Pathobiology* (Rifkin, D.B., and Klagsbrun, M. eds.) "Primary structure of a human basic fibroblast growth factor derived from protein and cDNA sequencing." pp. 32-36. Current Commun. in Mol. Biol., Cold Spring Harbor, New York.
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28. **Sommer, A.**, (1987). Yeast chromatin: Search for histone H1. *Mol. Gen. Genet.* 161, 323-331.
29. Nag, B., Tewari, D.S., **Sommer, A.**, Olson, H.M., Glitz, D.G., and Traut, R.R. (1987). Probing ribosome function and the location of *Escherichia coli* ribosomal protein L5 with a monoclonal antibody. *J. Biol. Chem.* 262, 9681-9687.
30. Carmichael, D.F., **Sommer, A.**, Thompson, R.C., Anderson, D.C., Smith, C.G., Welgus, H.G., and Stricklin, G.P. (1986). Primary structure and cDNA cloning of human fibroblast collagenase inhibitor. *Proc. Natl. Acad. Sci. USA* 83, 2407-2411.
31. Nag, B., Tewari, D.S., Etchison, J.R., **Sommer, A.**, Traut, R.R. (1986). Two monoclonal antibodies against *Escherichia coli* ribosomal protein L2 distinguish different locations for their respective epitopes in intact ribosomes. *J. Biol. Chem.* 261, 13892-13897.
32. Tewari, D.S., **Sommer, A.**, and Traut, R.R. (1986). The selective release of one of the two L7/L12 dimers from the *Escherichia coli* ribosome induced by a monoclonal antibody to the NH2-terminal region. *J. Biol. Chem.* 261, 6916-6923.
33. Olson, H.M., **Sommer, A.**, Tewari, D.S., Traut, R.R., and Glitz, D.G. (1986). Localization of two epitopes of protein L7/L12 to both the body and stalk of the large ribosomal subunit. Immune electron microscopy using monoclonal antibodies. *J. Biol. Chem.* 261, 6924-6932.
34. **Sommer, A.**, Etchison, J.R., Gavino, G., Zecherle, N., Casiano, C., and Traut, R.R. (1985). Preparation and characterization of two monoclonal antibodies against different epitopes in *Escherichia coli* ribosomal protein L7/L12. *J. Biol. Chem.* 260, 6522-6527.
35. Boileau, G., **Sommer, A.**, and Traut, R.R. (1981). Identification of proteins at the binding site for protein S1 in 70S ribosomes and 30S subunits by crosslinking with 2-iminothiolane. *J. Biol. Chem.* 256, 8222-8227.
36. **Sommer, A.**, and Traut, R.R. (1976). Identification of neighboring protein pairs in the *Escherichia coli* 30S ribosomal subunit by crosslinking with methyl-4-mercaptobutyrimidate. *J. Mol. Biol.* 106, 995-1015.
37. Kenney, J.W., **Sommer, A.**, and Traut, R.R. (1975). Crosslinking studies on the 50S ribosomal subunit of *Escherichia coli* with methyl-4-mercaptobutyrimidate. *J. Biol. Chem.* 250, 9434-9436.
38. **Sommer, A.**, and Traut, R.R. (1975). Identification by diagonal gel electrophoresis of nine neighboring protein pairs in the *E. Coli* 30S ribosomal subunit crosslinked with methyl-4-mercaptobutyrimidate. *J. Mol. Biol.* 97, 471-481.

39. Knopf, U.C., **Sommer, A.**, Kenny, J.W., and Traut, R.R. (1975). A new two-dimensional gel electrophoresis system for the analysis of complex protein mixtures: Application to the ribosome of *E. coli*. *Mol. Biol. Rep.* 2, 35-40.
40. **Sommer, A.**, and Traut, R.R. (1974). Diagonal polyacrylamide dodecyl sulfate gel electrophoresis for the identification of ribosomal proteins crosslinked with methyl-4-mercaptobutyrimidate. *Proc. Natl. Acad. Sci. USA* 71, 3946-3950.
41. **Sommer, A.**, and Lewis, M.J. (1971). Effect of dithiothreitol on yeast: Spheroplast formation and invertase release. *J. Gen. Microbiol.* 68, 327-335.
42. Sherrer, A., **Sommer, A.**, and Pfenninger, H. (1969). Neuere Methoden zum Nachweis wilder Hefen in der Brauerei. *Brauwissenschaft* 22, 191-195.